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The Slow Death of the Lakes

Author: Sreya Prakash, AQUA-Hub project, HubManager Coimbatore

The urban wetlands of Coimbatore are known and appreciated to have several benefits on the health of the city's environment. Historically built to control floods, they have also provided water security to the people of the region. Moreover, the lakes have been home to diverse species of flora and fauna. Several species of birds, even rare ones, flock to these lakes. The lakes have also played an integral role in the replenishment of groundwater in the region.

Coimbatore's lakes, despite its immense importance in Coimbatore's ecosystem, are depreciating in both quantity and quality. This decline began in the 1970s with the birth of industries in Coimbatore. The city grew around the lakes. As the city prospered, its river and lakes began to lose gaiety. Drying out of the Noyyal River, the main feed for the lakes has resulted in reduction of storm water being fed into the lakes. The lakes have reduced by 50% and have essentially become tanks of sewage and effluents. The factors that have affected the quality of water in these lakes can be detailed as follows:

- **Encroachments:** Developmental activities around the lakes have gradually nibbled away the area of the lakes. According to news reports in 2011, the eight lakes' combined area of 1,200 acres have reduced to around 800 acres, with the storage capacity shrinking from 380 MCFT¹ to 180 MCFT. The encroachments include agricultural fields, slums, roads, railway tracks and other establishments of public, private and government authority.
- **Incessant waste dumping:** Growing population, expanding industries and improved lifestyles have led to an increase in waste generated. The lakes have become dustbins of convenience for the general public. All waste dumped in the sewer lines also reach these lakes, untreated. The waste can range from plastics to faecal matter. There is no organized system to collect construction debris and this waste is also thrown into the lake.
- **Unplanned drainage systems:** The increase in population and encroachments have also led to increased sewage generation. The sewage generated from the hutments, and other establishments are let into the channels (without any treatment) that were originally designed to convey excess storm water from one lake to another. The drains are poorly maintained and have large amounts of weed infestations and solid waste at the culverts. The STPs² located at Ukkadam and Ondipudur remain highly underutilized. According to a

¹ MCFT = million cubic feet, 1 MCFT = 28,316.85 m³

² STP = sewage treatment plant

report by the Ministry of Housing and Urban Affairs (MoHUA), in September 2021, only 22.6% of Coimbatore's wastewater generated is treated effectively.

- **Industrial water pollution:** Small scale industries in Coimbatore do not have individual water treatment systems. Discharge of untreated effluent from such industries have not only polluted the lakes, but have also affected groundwater. Leaching of heavy metals into the water has been observed in the lakes. A noteworthy example of this is the possible presence of mercury in the waters at Selvachintamani Lake, because of the goldsmiths functioning in its vicinity. A study conducted in the year 2002 at 4 lakes (Selvachintamani, Ukkadam, Valankulam and Singanallur), had shown concentrations of many metals like Nickel, Lead, Cadmium etc.

The current status of the lakes leaves many people appalled. It is interesting to note that the lakes on the upstream side are not studied as often as the larger lakes downstream. A comprehensive study conducted in 2018, in 5 sites, showed significant decrease of 13 units in dissolved oxygen (DO) from the upstream source in Noyyal River to Singanallur Lake. Agricultural run-off and livestock waste are also dumped in these lakes. Free flow of domestic and industrial sewage into the lakes has resulted in increase of faecal coliform in the water. The pH of the water in the lakes have increased well beyond the limits for potable water, because of the alkaline nature of the industrial effluents and the ammoniacal complexes in domestic sewage. The pH progressively increases downstream, with the water in Singanallur Lake showing pH readings of 10.50 in the summer season. During the monsoon season with higher dilution, the pH at Singanallur Lake was 9.50. Chloride content has been noted to be particularly high in the Ukkadam wetland.

Post measurement of several parameters, researchers have also made efforts to calculate Water Quality Indices (WQI) like National Sanitation Foundation WQI (NSFWQI) and Modified NSFWQI. These indices are calculated by assigning different weights to the parameters measured. The values of the index gradually reduces from the source point at Noyyal (92.50) downstream. According to a study undertaken in 2020, the NSFWQI values at Ukkadam and Singanallur lakes were as low as 48 and 53 respectively.

Large areas of the lakes are covered by unwanted biological growth in the forms of water hyacinth, mesquite, and morning pink glory. This is an aftermath of the uncontrolled dumping of sewage in the lakes containing also nutrients. The aquatic life has also been adversely affected, the condition being aggravated by extreme heatwaves. Dead fishes have particularly been noticed in Selvachintamani and Valankulam lakes. There has also been a reduction in the population of migratory birds, because of habitat destruction.

Coimbatore needs immediate and effective efforts to rise from the deep pits of deterioration of water bodies through pollution. A well-planned solid waste management system is imperative and shows that the challenges go beyond water management. In addition, regular water quality monitoring and (semi-)decentralised water treatment systems used to full capacities must be the way forward. Water is vital for a healthy society and a sustainable environment. Let us join hands in developing Coimbatore into a self-sustaining Water Innovation Hub.

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Contact

B.Tech. Sreya Prakash	AQUA-Hub project, Water Innovation Hub Coimbatore, HubManager Coimbatore/India, sreya.prakash@gmail.com
Dr. Stefan Liehr	ISOE – Institute for Social-Ecological Research, Frankfurt am Main/Germany, AQUA-Hub subproject head, liehr@isoe.de
M.Sc. Marc Beckett	Fraunhofer Institute for Interfacial Engineering and Biotechnology (IGB), Stuttgart/Germany, AQUA-Hub project coordination, marc.beckett@igb.fraunhofer.de
Dr. Marius Mohr	Fraunhofer Institute for Interfacial Engineering and Biotechnology (IGB), Stuttgart/Germany, AQUA-Hub project coordination, marius.mohr@igb.fraunhofer.de

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The AQUA-Hub project

In the AQUA-Hub project Water Innovation Hubs are being implemented in the two Indian Smart Cities, Coimbatore (Tamil Nadu) and Solapur (Maharashtra), and accompanied by pilot measures of German technology for water quality monitoring. AQUA-Hub addresses the needs of the local water sectors identified in previous projects, as well as the challenges of the German water industry to develop projects, relationships and business on the Indian market. Qualified HubManagers as a local presence of the Water Innovation Hubs are of great importance for the relations and the exchange of information between the German and Indian actors. In addition to network activities and the mediation of business partners, the hubs fulfil the function of project centres for the realisation of technical demonstration projects, provide information on current developments in the water sector for the respective local situations and support the access to water technologies "Made in Germany".

For more information: www.aqua-hub.de

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AQUA-Hub project

ISOE – Institute for Social-Ecological Research

Hamburger Allee 45, 60486 Frankfurt am Main, Germany

Phone +49 69 707 69 19-0, E-Mail: info@isoe.de

Appendix



Figure 1: Waste dumping in the outlet of Selvachintamani Lake in April 2022.
Source: AQUA-Hub Project Team (Liehr)

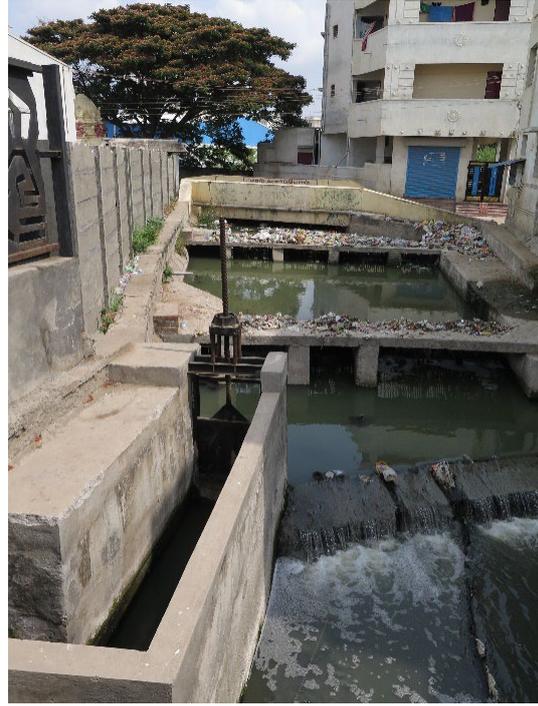


Figure 2: Untreated wastewater entering Selvachintamani Lake in April 2022.
Source: AQUA-Hub Project Team (Liehr)



Figure 3: Heavy biological growth in the inlet of Valankulam Lake in April 2022. Source: AQUA-Hub Project Team (Prakash)



Figure 4: Canal in Ondipudur with large amount of foam on the water surface in July 2018. Source: AQUA-Hub Project Team (Liehr)